



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/645,132

08/21/2003

Fred P. Reinhard

5413P003

7130

8791

7590

09/22/2009

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040

EXAMINER

WILKINS III, HARRY D

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

09/22/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/645,132

Applicant(s)

REINHARD, FRED P.

Examiner

Harry D. Wilkins, III

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Pre-Appeal Conference Decision

1. During the pre-appeal conference, it was determined that Faita did not properly reject claim 1 of the present application because the spacer (gasket) of Faita was not "between" the anode electrode or the cathode electrode and the membrane.
2. Therefore, the rejection of claim 1 (and its dependent claims) based on Faita are hereby withdrawn. The rejection of claim 14 and its dependent claims is also withdrawn.
3. Therefore, the rejection grounds for claims 19 and 20 based on Faita are also withdrawn, but for the reason that the electrodes of Faita are situated outside the cell frames, such that they anode and cathode are not contained within the first or second compartment.
4. Note that this also includes withdrawal of the obviousness-type double patenting rejections over copending application no. 10/763,691.
5. Because certain claims were only rejected using Faita, prosecution is being reopened and a new search performed to properly address all of the dependent claims.

REJECTIONS BASED ON INOI et al

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 6, 7 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Inoi et al (JP 61-056289).

Inoi et al anticipate the invention as claimed. Inoi et al teach (see English abstract and figures 1 and 2) an apparatus including a first cell frame (C_1), a second cell frame (A_1) including an inlet (7) and an outlet (6) arranged above the inlet, a compartment formed between the first and second cell frames including an anode electrode (A), a cathode electrode (C) and a membrane (M) positioned in between and screen spacers (P_m) interposed between the anode electrode (A) and the membrane (M) and between the cathode electrode (C) and the membrane (M) as this claim is interpreted (see above in paragraphs 2-5). Further, Inoi et al teach (see English abstract) that the spacers (P_m) had the function of permitting precise spacing of the anode or cathode from the membrane.

Regarding claims 6 and 7, these claims relate to the manner in which the claimed apparatus operates. The manner in which an apparatus is not given patentable weight as long as the apparatus was capable of operating in the claimed fashion. See MPEP 2114. The device of Inoi et al would have been capable of operating in the claimed fashion. Thus, Inoi et al teaches the structure of the apparatus as claimed.

Regarding claim 11, Inoi et al teach (see figure 1) including inflow and outflow ports in both cell frames.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1795

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 5 and 14-18 are rejected under 35 U.S.C. 103(a) as being obvious over Inoi et al (JP 61-056289) with evidence from "Newest News About Brown's Gas".

The teachings of Inoi et al are described above.

Inoi et al do not teach a sidewall or endwall of the second cell frame being transparent or translucent.

One of ordinary skill in the art would have found it obvious to have made either or both of the sidewall and endwall of a cell frame to be transparent in order that the indicators of a reaction (such as formation of gas bubbles) might be viewed by the operator.

Evidence that such modification was known to one of ordinary skill in the art of electrolyzers can be seen in "Newest News About Brown's Gas". On the first page is described and pictured, an electrolyzer made from a transparent housing so that internal formation of bubbles could be visually detected while the electrolyzer was being operated. Thus, the Examiner has shown that it was well within the knowledge of one of ordinary skill in the art to make portions of an electrolyzer transparent for the purpose of allowing visual inspection of reaction progression, particularly for noticing the formation of gas bubbles.

Regarding claim 16, Inoi et al teach (see figure 1) including multiple sets of first and second frames, each set separated by another frame (P_a or P_c). This additional

frame would be expected to be made of non-conductive material to prevent short circuiting between adjacent cells.

Regarding claim 18, these claims relate to the manner in which the claimed apparatus operates. The manner in which an apparatus is not given patentable weight as long as the apparatus was capable of operating in the claimed fashion. See MPEP 2114. The device of Inoi et al would have been capable of operating in the claimed fashion. Thus, Inoi et al teaches the structure of the apparatus as claimed.

10. Claims 8-10 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoi et al (JP 61-056289) in view of Hirai et al (US 5,783,051) with evidence from "Newest News About Brown's Gas" (for claims 10 and 19).

The teachings of Inoi et al are described above.

However, Inoi et al are silent with respect to how the two cell frames are joined together.

Hirai et al teach (see figure 3) a conventional way of clamping two or more cell frames together by means of a first clamping frame (end plate) 60 and a second clamping frame (end plate) 60', a plurality of fastening rods 92 inserted through apertures on the clamping frames and a plurality of fastening components (96) positioned on a corresponding end of each rod.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the conventional clamping manner taught by Hirai et al to hold the two frames of Inoi et al together because the clamping manner taught by Hirai et al provided a reliable, but easy to remove, manner for ensuring the cell would stay together.

Regarding claim 10, one of ordinary skill in the art would have found it obvious to have made the sidewall of the second cell frame to be transparent in order that the indicators of a reaction (such as formation of gas bubbles) might be viewed by the operator. It would have been obvious to ensure that any portion of the clamping frame which might block the transparent sidewall to also be transparent, or to have added an opening so that the view would remain clear.

Evidence that such modification was known to one of ordinary skill in the art of electrolyzers can be seen in "Newest News About Brown's Gas". On the first page is described and pictured, an electrolyzer made from a transparent housing so that internal formation of bubbles could be visually detected while the electrolyzer was being operated. Thus, the Examiner has shown that it was well within the knowledge of one of ordinary skill in the art to make portions of an electrolyzer transparent for the purpose of allowing visual inspection of reaction progression, particularly for noticing the formation of gas bubbles.

Regarding claims 19 and 20, Inoi et al do not expressly teach a tank containing a process solution to be treated. A process line inherently would have been present connected to in-flow port 5. One of ordinary skill in the art would have considered it obvious to have added a tank to the apparatus of Inoi et al for holding the solution to be treated because the tank would have allowed a buffer of solution to be treated to be stored.

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoi et al (JP 61-056289) in view of Tejeda (US 3,869,376).

The teachings of Inoi et al are described above.

Inoi et al fail to teach including two membranes separated by a non-conductive frame as claimed.

Tejeda teach (see figure 1) an alternative electrolytic cell arrangement that has three chambers, where an anode chamber is separated from a center chamber by an ion-exchange membrane, and the center chamber is separated from the cathode chamber by an additional ion-exchange membrane. Tejeda further teach that the membranes are held in place between the chambers by means of gaskets (see col. 7, lines 45-59).

Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the electrolytic cell of Tejeda to be used with the modular electrolytic cell design of Inoi et al by constructing cell frames as shown by Inoi et al, and inserting an additional membrane (M) between adjacent anode (A) and cathode (C) with a non-conductive frame (20 of Tejeda) separating the two membranes, and to have included spacers (gaskets) between each of the membranes and the non-conductive frame to permit the three-chambered arrangement of Tejeda to be establish in the electrolytic cell of Inoi et al which had the capability of being easily expanded or reduced in size as needed.

REJECTIONS BASED ON YOSHIDA

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 1795

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-4, 6-9 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshida (JP 59-64786).

Yoshida anticipate the invention as claimed. Yoshida teaches (see figure 1 and English abstract) an electrolytic cell including a first cell frame (17) and a second cell frame (1) including an in-flow port (2) and an out-flow port (3) located along the perimeter of the second cell frame, the out-flow port above the in-flow port, a compartment formed between the first cell frame and the second cell frame, the compartment housing an anode electrode (5), a cathode electrode (15) and a membrane (10) positioned between the two electrodes, and a screen spacer (gasket 11) interposed as an interface between the anode electrode and the membrane or a screen spacer (gasket 20) interposed as an interface between the cathode electrode and the membrane. The gasket would provide the function of establishing a set distance between the electrode and the membrane.

Regarding the recitation of “for purification of an in-flow solution”, the limitation relates to the intended use of the claimed apparatus, and thus fails to further limit the structural features of the claim.

Regarding claim 2, Yoshida teach including a screen spacer (gasket) on either side of the membrane.

Regarding claim 3, the anode (5) of Yoshida is configured as a self-supporting screen including at least one connector for attachment to a bus bar.

Regarding claim 4, the cathode (15) of Yoshida is also configured as a self-supporting screen with at least one connector protruding for connection to a bus bar.

Regarding claims 6 and 7, these claims relate to the manner in which the claimed apparatus operates. The manner in which an apparatus is not given patentable weight as long as the apparatus was capable of operating in the claimed fashion. See MPEP 2114. The device of Yoshida et al would have been capable of operating in the claimed fashion. Thus, Yoshida et al teach the structure of the apparatus as claimed.

Regarding claim 8, Yoshida et al teach (see figure 2) that assembly of the electrolytic cell included a first clamping frame (22) and a second clamping frame (also 22) with the cell frames located between them, a plurality of fastening rods (23) inserted through apertures of the clamping frames and a plurality of fastening components (nuts) each positioned on a corresponding end of one of the rods.

Regarding claim 9, the fastening components (nuts) were threaded onto a corresponding end of the rods.

Regarding claim 11, the first cell frame (17) of Yoshida et al included in-flow (not shown) and out-flow (13) ports as claimed.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 5, 10 and 13-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al (JP 59-064786) with evidence from "Newest News About Brown's Gas".

The teachings of Yoshida et al are described above.

Yoshida et al do not teach a sidewall or endwall of the second cell frame being transparent or translucent.

One of ordinary skill in the art would have found it obvious to have made any of the sidewall and endwall of a cell frame or a clamping frame to be transparent in order that the indicators of a reaction (such as formation of gas bubbles) might be viewed by the operator.

Evidence that such modification was known to one of ordinary skill in the art of electrolyzers can be seen in "Newest News About Brown's Gas". On the first page is described and pictured, an electrolyzer made from a transparent housing so that internal formation of bubbles could be visually detected while the electrolyzer was being operated. Thus, the Examiner has shown that it was well within the knowledge of one of ordinary skill in the art to make portions of an electrolyzer transparent for the purpose of allowing visual inspection of reaction progression, particularly for noticing the formation of gas bubbles.

Regarding claim 16, Yoshida et al teach (see figure 1 and English abstract) including multiple sets of first and second frames, each set separated by another frame. This additional frame would be expected to be made of non-conductive material to prevent short circuiting between adjacent cells.

Regarding claim 18, these claims relate to the manner in which the claimed apparatus operates. The manner in which an apparatus is not given patentable weight as long as the apparatus was capable of operating in the claimed fashion. See MPEP 2114. The device of Yoshida et al would have been capable of operating in the claimed fashion. Thus, Yoshida et al teaches the structure of the apparatus as claimed.

16. Claims 8-10 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al (JP 59-064786) in view of Hirai et al (US 5,783,051) with evidence from "Newest News About Brown's Gas" (for claims 10 and 19).

The teachings of Yoshida et al are described above.

However, Yoshida et al are silent with respect to how the two cell frames are joined together beyond a statem

Hirai et al teach (see figure 3) a conventional way of clamping two or more cell frames together by means of a first clamping frame (end plate) 60 and a second clamping frame (end plate) 60', a plurality of fastening rods 92 inserted through apertures on the clamping frames and a plurality of fastening components (96) positioned on a corresponding end of each rod.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the conventional clamping manner taught by Hirai et al to hold the two frames of Inoi et al together because the clamping manner taught by Hirai et al provided a reliable, but easy to remove, manner for ensuring the cell would stay together.

Regarding claim 10, one of ordinary skill in the art would have found it obvious to have made the sidewall of the second cell frame to be transparent in order that the

indicators of a reaction (such as formation of gas bubbles) might be viewed by the operator. It would have been obvious to ensure that any portion of the clamping frame which might block the transparent sidewall to also be transparent, or to have added an opening so that the view would remain clear.

Evidence that such modification was known to one of ordinary skill in the art of electrolyzers can be seen in "Newest News About Brown's Gas". On the first page is described and pictured, an electrolyzer made from a transparent housing so that internal formation of bubbles could be visually detected while the electrolyzer was being operated. Thus, the Examiner has shown that it was well within the knowledge of one of ordinary skill in the art to make portions of an electrolyzer transparent for the purpose of allowing visual inspection of reaction progression, particularly for noticing the formation of gas bubbles.

Regarding claims 19 and 20, Inoi et al do not expressly teach a tank containing a process solution to be treated. A process line inherently would have been present connected to in-flow port 5. One of ordinary skill in the art would have considered it obvious to have added a tank to the apparatus of Inoi et al for holding the solution to be treated because the tank would have allowed a buffer of solution to be treated to be stored.

17. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al (JP 59-064786) in view of Tejeda (US 3,869,376).

The teachings of Yoshida et al are described above.

Yoshida et al fail to teach including two membranes separated by a non-conductive frame as claimed.

Tejeda teach (see figure 1) an alternative electrolytic cell arrangement that has three chambers, where an anode chamber is separated from a center chamber by an ion-exchange membrane, and the center chamber is separated from the cathode chamber by an additional ion-exchange membrane. Tejeda further teach that the membranes are held in place between the chambers by means of gaskets (see col. 7, lines 45-59).

Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the electrolytic cell of Tejeda to be used with the modular electrolytic cell design of Yoshida et al by constructing cell frames as shown by Yoshida et al, and inserting an additional membrane (10) between adjacent anode (5) and cathode (15) with a non-conductive frame (20 of Tejeda) separating the two membranes, and to have included spacers (gaskets) between each of the membranes and the non-conductive frame to permit the three-chambered arrangement of Tejeda to be establish in the electrolytic cell of Yoshida et al which had the capability of being easily expanded or reduced in size as needed.

Response to Arguments

18. Applicant's arguments filed 13 August 2009 with respect to Inoi et al have been fully considered but they are not persuasive. Applicant has argued that Inoi et al do not teach a cell frame including in-flow and out-flow ports placed on a perimeter of the cell frame.

19. In response, the ports, 6 and 7 of Inoi et al, are at a perimeter of the cell frame. The claim language does not specify that the ports open to the outside of the cell frame, only that they are located at the perimeter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/
Primary Examiner, Art Unit 1795

hdw